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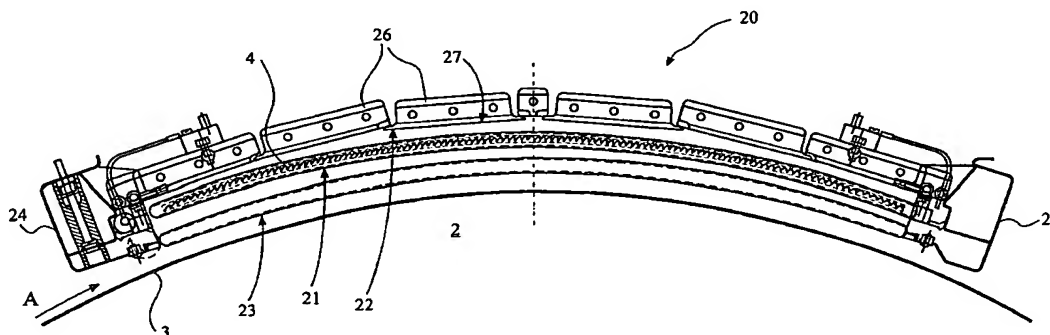
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(54) Title: **INFRA RED DRYER**



(57) Abstract: An IR dryer (20), for use in drying a continuous paper web (3) by means of IR radiation, comprising an array of IR emitters (21) arranged, in use, in spaced relation to the paper web and a lamp protection plate (23) intermediate the IR emitters (21) and the paper web (30). At least one of the lamp protection plate (23) and the array of IR emitters (21) is curved whereby drying a paper web (3) which moves in a curved path is facilitated.

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INTERNATIONAL SEARCH REPORT

onal Application No

PCT/GB 03/00697

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 D21F5/00 F26B3/28 C03B23/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 D21F F26B G05D A61G C03B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 882 852 A (KAUTTO JORMA) 28 November 1989 (1989-11-28)	1,9
Y	the whole document	3,6,30
Y	DE 33 17 714 A (IMPACT SYSTEMS INC) 8 December 1983 (1983-12-08)	1,3,6
Y	US 4 942 675 A (SUNDQVIST HANS) 24 July 1990 (1990-07-24)	1
Y	US 3 293 770 A (RAUSKOLB FRED W) 27 December 1966 (1966-12-27)	3
	the whole document	
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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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- "A" document defining the general state of the art which is not considered to be of particular relevance
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- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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- "&" document member of the same patent family

Date of the actual completion of the international search

10 September 2003

Date of mailing of the international search report

18.09.03

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INTERNATIONAL SEARCH REPORT

International Application No

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 1 060 727 A (DATEX OHMEDA INC) 20 December 2000 (2000-12-20) figures 3A,3B	6,30
A	US 4 433 994 A (TAKAHASHI KATSUYU ET AL) 28 February 1984 (1984-02-28) the whole document	11,15

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB 03/00697

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-10,29-31

An IR dryer for use in drying a continuous paper web by means of IR radiation.

2. Claims: 11-28

Method and apparatus for bending an elongate quartz tube and curved quartz tube.

INTERNATIONAL SEARCH REPORT

tional Application No

PCT/GB 03/00697

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4882852	A	28-11-1989	FI 864449 A	01-05-1988
			AT 66262 T	15-08-1991
			DE 3772198 D1	19-09-1991
			EP 0288524 A1	02-11-1988
			WO 8803193 A1	05-05-1988
			JP 1501073 T	13-04-1989
			JP 2688904 B2	10-12-1997
			NO 882900 A ,B,	29-06-1988
DE 3317714	A	08-12-1983	US 4494316 A	22-01-1985
			DE 3317714 A1	08-12-1983
			JP 1651193 C	30-03-1992
			JP 3004830 B	24-01-1991
			JP 58224286 A	26-12-1983
			SE 451381 B	05-10-1987
			SE 8303172 A	08-12-1983
			CA 1240142 A1	09-08-1988
			FI 840966 A ,B,	15-09-1984
			FR 2542858 A1	21-09-1984
			GB 2136549 A ,B	19-09-1984
US 4942675	A	24-07-1990	FI 79156 B	31-07-1989
			DE 3907168 A1	12-10-1989
			SE 8900730 A	09-09-1989
US 3293770	A	27-12-1966	SE 311471 B	09-06-1969
EP 1060727	A	20-12-2000	US 6245010 B1	12-06-2001
			CA 2300594 A1	20-11-2000
			EP 1060727 A1	20-12-2000
			JP 2000354614 A	26-12-2000
US 4433994	A	28-02-1984	NONE	